Effective Disaster Warnings, a National Tragedy

A tornado has just touched down in your county. The main highway is closed because of a chemical spill. Terrorists have put poison in the water system of your town. A flash flood has been spotted near where you live or work. What should you do?

Accurate information delivered in a timely way can make the difference between whether you take the most appropriate action to protect yourself and your loved ones or whether you dither about what to do or even take actions that will increase your risk.

Current news broadcast systems work well for long-term warnings such as a hurricane. Many days before a hurricane is a direct threat, the network news channels are explaining where landfall is likely and how intense the storm is likely to be.

But warnings for chemical spills, terrorism, tornadoes, floods, or earthquakes, for example, rarely are available days in advance. The exact track of a tornado is very difficult to predict, but its progress can be monitored and specific communities at risk can be alerted minutes in advance if a communication system is available.

Scientists are improving the accuracy and increasing the lead-time for warnings. Emergency managers are improving their information gathering and response systems. The problem is how to deliver critical information over the last mile, that is to the people at risk no matter where they are and what they are doing. Experience shows that when people are showered with warnings that do not apply directly to them, they tend to tune-out all warnings in the future. Thus we need to focus warnings only on those at risk.

In this technological age there are numerous systems that can warn just the people at risk, but they have not been implemented in the United States. The basic problem is widespread confusion over the roles of government and industry and a major lack of coordination between the government and private groups involved. The poor state of warning systems in the US is indeed a national tragedy.

A recent report, *Effective Disaster Warnings*, released by the National Science and Technology Council (NSTC), summarizes existing warning systems, the basic issues involved in providing effective warnings, and the many technologies that now exist that could be used to issue timely warnings. Their primary conclusion is that a public-private partnership is needed to bring the appropriate people together to implement effective warning systems. They point out that most warnings are currently issued by Federal, State, and local government authorities but most current or potential warning delivery systems are owned and operated by private industry. The inadequate coordination is based on history, unclear signals from several different branches of government, fears of government mandate, and the difficulties of finding private investors for "government related" ventures.

Our current national warning system is the Emergency Alert System (EAS) managed by the Federal Communications Commission and implemented by private broadcasters under government mandate. This system, originally designed to allow the president to address the

nation in times of crisis, interrupts local programming. Only major national warnings must be relayed by this system. Most broadcasters and advertisers are not excited about increasing the number of regional and local warnings. Furthermore this system reaches many more people than those at risk from most disasters. Digital coding has been added that can focus the warning on a small part of a county, but few receivers exist to decode the messages.

NOAA Weather Radio (NWR) is another national system that can now be received by over 95% of the population. It provides regular weather forecasts for the region around each transmitter and issues warnings in both verbal and digital format. The problem is that this Federal system uses a federal radio frequency far from the AM/FM bands and thus requires a special receiver. Imagine how much more effective NWR could be if it broadcast in the AM or FM band so that every radio and television could have built-in circuitry to detect local warnings and to interrupt programming or even turn the receiver on, turn the volume up, and issue the warning only to those to whom it applies. The Radion Data System (RDS) does this in the FM band and is in widespread use in Europe but not in the US.

Cellular telephones are becoming an American fixture with 111 million in use and with rapid growth anticipated in this market. The technology is available to broadcast to all telephones within a cell or to dial up all telephones in a cell. Imagine how many lives could be saved issuing warnings this way as a tornado weaves across the countryside! Despite the determined effort of several citizens to promote such a system, industry has been slow to respond because they fear a government mandate similar to the Emergency Alert System for broadcast stations. Furthermore the confused roles of public and private groups make it difficult for industry to evaluate the business potential.

Many entrepreneurs are developing systems to broadcast warnings only to the people at risk. Some have found limited applications around nuclear reactors and oil refineries, but business potential is limited and confused by government officials who still push outdated existing systems, by liabilities associated with issuing warnings, by the confused roles of public and private groups, by the reticence of investors to be associated with disasters or to be involved with "government related" programs, and by the fog that obscures who is responsible for what and where the business opportunities lie.

It is time to bring the people together on all sides of these issues to set some clear goals, agree on roles, and deliver to the American People the effective warnings that they deserve. We do not need more government. We need an effective Public/Private Partnership.

For more information, read the report "Effective Disaster Warnings" at (http://www.nnic.noaa.gov/CENR/NDIS_rev_Oct27.pdf). This report was the result of a year-long study by 19 Federal employees who specialize in disaster warnings in a dozen Federal agencies. This working group on Natural Disaster Information Systems (NDIS) was appointed by the Sub-Committee on Natural Disaster Reduction under the NSTC's Committee on Environment and Natural Resources.

Peter L. Ward, Ph.D.